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## REMARKS

The present RCE Patent Application is filed in response to the final rejection, on June 3, 2003, of all then-pending claims present in the immediate predecessor U.S. patent application.

In this RCE Patent Application, and by virtue of entry of the present Preliminary Amendment, claims 5 and 6 are to be cancelled, without prejudice, and claim 4 (which had been Previously Amended) is to be further amended.

As a consequence of entry of this Preliminary Amendment, there will exist in this case a single independent claim, Previously and Currently Amended Claim 4, which is now modified to contain language similar to that which was presented in original claim 1, previously cancelled. Claim 4 now unequivocally is written with language that is presented and supported in the originally filed, underlying, priority, Provisional U.S. Patent Application, Serial No. 60/281,604, filed April 4, 2001 for "Cushioning Shoe Insole".

Provided with this Preliminary Amendment are copies of documents that were referred to in the underlying priority provisional patent application as Documents A and B, which, in accordance with a request made by the Examiner herein, are reflected now additionally in the current record of this case by way of naming them on the enclosed, supplemental PTO Form-1449.

As Applicants believe the Examiner will now surely recognize, completely lacking from the teachings and suggestions of the prior art is the employment, in a cushioning shoe insole, of a cushioning layer which is both viscoelastic, an thus capable of so-called slow-return response to a deflection, and in addition, *acceleration-rate-sensitive* so that it responds in a unique way to the initial application of a deflecting or deforming force to this material. No illustration or

language in any of the known and cited art suggests the use of such a material -- a material which is central to applicants' invention.

Further significantly lacking from the teachings and suggestions of the prior art is any proposal for the use of such an acceleration-rate-sensitive material along with a surface-joined, moisture-wicking fabric layer which includes tension-active, elongate, load-distributing fibres. As applicants have pointed out previously herein, the unique combination of these two materials produces some quite unexpected and unpredictable shock-handling performance results, especially under circumstances where the invented insole structure is wet (as from sweat). No materials shown or suggested in the cited and applied prior art offer anything whatsoever possessing or hinting at these special invention characteristics.

Quite apart from the non-issue regarding whether or not applicants have specifically elaborated (as in the text of the specification) the natures and believed behavioral mechanisms of the cooperative interactions that take place between the two, recited, interactive layers in applicants' invented cushioning insole structure, those performance aspects of the invention occur as matters of fact when these two layers are brought together (and employed) as claimed herein -- claimed, that is, now in further-amended Claim 4, and as was similarly claimed in originally presented Claim 1 (previously cancelled). This important combinational layer structure has been unchangingly presented in this case beginning with the foundation provisional patent application.

Now-cancelled Claims 5 and 6 were previously introduced in the parent to this case to display, in claim-form language, an expression of these believed natures and mechanisms. No new matter whatsoever was introduced by those claims. Current cancellation of these two claims

is proposed herein simply to move this application more simply toward appropriate allowance.

Notwithstanding nonprejudicial cancellation herein of Claims 5 and 6, applicants' previously amendment-entered discussion about believed behaviors is thought to be accurate and informative about the cooperative interactions of the two layers plainly set forth in the single remaining claim now present in this application. What now immediately follows herein is a discussion about formal documentation (accompanying this Preliminary Amendment) that confirms applicants' earlier-given commentary about cooperative layer performance in the claimed cushioning insole structure. This discussion specifically relates to the above-referred-to "Test Report".

As a part of applicants' exploration of the present invention, applicants requested, from an appropriate independent testing laboratory, that certain shock-absorbing tests be performed, in a comparative manner, so as to observe and evaluate the shock-absorbing capabilities of the combination layer structure of the present invention. Accompanying this Preliminary Amendment, accordingly, are photocopies of two pages of a Test Report generated from that requested testing activity. This Report presents, and compares numerically, a collection of shock-absorbing responses that were observed under certain defined impact circumstances created in the fore-foot and rear-foot areas of several insole structures, including, of course, insole structures made in accordance with the present invention.

As can be seen from the enclosed and reported test results, which results compare performances under three different test conditions clearly enumerated in the Report text, five different key parameters that relate to shock-absorbing behavior were, in every instance, significantly improved. One can clearly see from these reported results that improvement occurred

not only just by virtue of the presence of an insole structure made in accordance with the present invention in a *dry* condition ("Condition 2" in the Report), but very impressively, and even with greater performance enhancement, with the insole structure of this invention being in a definitively *wetted* condition ("Condition 3" in the Report). "Condition 1" in the Report relates to tests of a shoe (a boot) which did not have applicants' insole installed.

It is applicants' combined layer structure, as set forth now in Claim 4, which furnishes this significantly improved shock-absorbing behavior in a shoe insole. It is the unique current-invention combination of (1) a viscoelastic and *acceleration-rate-sensitive* cushioning layer, with (2) a joined overlayer (upper-surface layer) of a moisture-wicking fabric, including elongate load-distributing fibres, that creates such improved shoe insole performance.

Accordingly, favorable reconsideration of this application, and early allowance of the single claim presented herein, are respectfully solicited. If the Examiner has any questions regarding the amendment or remarks, the Examiner is invited to contact Attorney-of-Record Jon M. Dickinson, Esq., at 503-504-2271.

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any over-payment to Account No. 22-0258.

Customer Number

23855
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Respectfully Submitted,

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**CERTIFICATE OF EXPRESS MAILING**

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Date of Deposit - July 10, 2003

I hereby certify that the attached Preliminary Amendment in Support of RCE, test report, PTO Form 1449 and 2 references, and a check in the amount of $375.00 are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to:

MS RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Robert D. Varitz

TEST REPORT



## Impact Test

An Exeter Research Impact Tester (Exeter Research, Brentwood, NH) was used to assess impact and rebound. This instrument is designed to test footwear according to proposed, but not yet adopted, ASTM standards. It consists of a metal shaft, or missile, that slides freely in the vertical plane. The missile head attached to the metal shaft is a solid, metal cylinder, 10.2 cm long, with a diameter of 4.5 cm. The shaft and the missile head have a combined mass of 3 kg. Another mass is added to the top of the shaft to obtain a drop mass of 8.5 kg. The drop height of the missile is set at 5 cm. The footwear being tested is held in place below the shaft by a clamp. The impact test instrument is computer interfaced and samples at 3000 Hz via an A/D converter. The computer controls the missile drop height and the number of impacts, or drops. A linear variable differential transducer (LVDT) and a Kistler force transducer return the data on each drop of the missile to the computer via the A/D converter. In the context of the human/footwear system, the impact tester is intended to mimic the foot hitting the ground at foot strike.

The rearfoot of each sample is subjected to 25 preliminary impacts, immediately followed by 10 test impacts. Data on parameters describing each impact were recorded during each of the test impacts, but not during the preliminary impacts. For each parameter, a mean was calculated over the data for the 10 test impacts on the rearfoot.

## Test Conditions

There were three test conditions designated by the manufacturer: 1) Army ICB boot with no insole; 2) Army ICB boot with dry insole; and 3) Army ICB boot with wet insole. For the wet condition, the insoles were submerged in a basin of water for 5 minutes. All conditions were tested in the rearfoot and forefoot regions.

## Results

The test results (means and standard deviations) for the rearfoot region are summarized in the following table.

REAR FOOTFALL

| Condition | | Pg (g) | TTP (ms) | Pressure (kPa) | Penetration (%) | Energy Return (%) |
|---|---|---|---|---|---|---|
| 1 | mean | 17.99 | 4.50 | 942.67 | 9.57 | 39.67 |
| | sd | (0.15) | (0.17) | (7.68) | (0.10) | (0.32) |
| 2 | mean | 14.53 | 5.55 | 778.45 | 17.35 | 28.25 |
| | sd | (0.23) | (0.39) | (11.85) | (1.00) | (0.23) |
| 3 | mean | 12.44 | 5.93 | 652.00 | 18.48 | 22.55 |
| | sd | (0.07) | (0.17) | (3.59) | (0.17) | (0.56) |

How is this pertinat to applicants invention?

The test results (means and standard deviations) for the forefoot region are summarized in the following table.

FRONT FOOTFALL

| Condition | | Pg (g) | TTP (ms) | Pressure (kPa) | Penetration (%) | Energy Return (%) |
|---|---|---|---|---|---|---|
| 1 | mean | 22.28 | 4.07 | 1167.76 | 9.12 | 34.03 |
| | sd | (0.14) | (0.13) | (7.12) | (0.15) | (0.20) |
| 2 | mean | 16.95 | 4.87 | 888.15 | 16.92 | 21.49 |
| | sd | (0.20) | (0.31) | (10.56) | (0.78) | (0.21) |
| 3 | mean | 13.71 | 5.57 | 718.39 | 19.33 | 17.25 |
| | sd | (0.12) | (0.15) | (6.42) | (0.15) | (0.26) |

## Interpretation of Results

Pg (peak acceleration) – lower numbers indicate greater shock attenuation.

TTP (time to peak acceleration) – higher numbers indicate greater shock attenuation.

Pressure – lower numbers indicate greater shock attenuation.

Penetration – higher numbers indicate greater shock attenuation.

Energy Return – lower numbers indicate greater shock attenuation.

The footwear conditions tested could be ranked in the rearfoot as 3, 2, 1 from the most shock attenuating to the least shock attenuating. In the forefoot, the conditions tested are ranked 3, 2, 1 from the most shock attenuating to the least shock attenuating.